

Work Order ID 100361

April-22-13 1:02:36 PM

\*100361\*

Page 1

Item ID: D3012-5

Accept

\*N900040100\*

Setup Start

\*NS1\*

Revision ID:

Item Name: Decal

Stop

\*NS2\*

Start Date: 5/28/13

Start Qty: 12.00

\*12\*

Cust Item ID:

Required Date: 5/28/13

Req'd Qty: 12.00

\*12\*

Customer:

Reference:

Approvals: Process Plan: MUS

Date: 13-04-23

Tooling: SPC (Y/N):

Date:

Run Start

\*NR1\*

QC:

Date:

Date:

Stop

\*NR2\*

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
Draw Nbr	Revision Nbr								
100 <b>*100*</b> Purchasing	PURCHASING Issue P/O: 19670 Make as per Dwg D3012 Manufacture from 3M 7mil masking film p/n 8522CP Material release note is required	0.00							13-04-23
110 <b>*110*</b> Packaging	Receive & Inspect for Damage & Mat'l Certs Memo Ensure Material Release Note is attached	0.00							14/3/13 B Q2
120 <b>*120*</b> QC Quality Control	QC6- Inspect dimensions to drawing Memo	0.00 0.00	248 228 BS3					12	

NCR: Yes / No

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order: _____			DISPOSITION			AGAINST DEPARTMENT/PROCESS									
Part No. _____	<input type="checkbox"/> Rework <input type="checkbox"/> Scrap <input type="checkbox"/> Use-as-is <input type="checkbox"/> Work Order Update		Skid-tube <input type="checkbox"/> Machining <input type="checkbox"/> Thermoforming <input type="checkbox"/> Large Fab <input type="checkbox"/>	Crosstube <input type="checkbox"/> Small Fab <input type="checkbox"/> Finishing <input type="checkbox"/> Composite <input type="checkbox"/>	Water Jet <input type="checkbox"/> Prod. Eng. Coor. <input type="checkbox"/> Rec/Store/Packaging <input type="checkbox"/> Supplier <input type="checkbox"/>	Engineering <input type="checkbox"/> Quality <input type="checkbox"/> Other <input type="checkbox"/>									
NCR No. _____															
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance		Initial Chief Eng	Action Description		Sign & Date	Verification	QC Inspector				
Doc/Data <input type="checkbox"/> Equip/Tooling <input type="checkbox"/> Operator <input type="checkbox"/> Material <input type="checkbox"/> Setup <input type="checkbox"/> Other <input type="checkbox"/> Process <input type="checkbox"/> Supplier <input type="checkbox"/> Training <input type="checkbox"/> Unapproved <input type="checkbox"/>															
FAULT CATEGORY															
<b>Landing Gear</b> <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimped <input type="checkbox"/> Cuffs <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Ripples in Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damaged <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drill Holes <input type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Folio				<input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Offset <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions				<input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge		<input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled	

Work Order ID 100361

\*100361\*

Page 2

April-22-13 1:02:36 PM

Item ID: D3012-5

Accept

\*N900040100\*

Setup Start

\*NS1\*

Revision ID:

Stop

\*NS2\*

Item Name: Decal

Start Date: 5/28/13 Start Qty: 12.00

\*12\*

Cust Item ID:

Required Date: 5/28/13 Req'd Qty: 12.00

\*12\*

Customer:

Reference:

Approvals:

Process Plan:

Date:

Tooling:

Date:

Run Start

\*NR1\*

QC:

Date:

SPC (Y/N):

Date:

Stop

\*NR2\*

Sequence ID/  
Work Center ID

Operation  
Description

Set Up/  
Run Hours

Tool ID

Tool #

Plan  
Code

Accept  
Qty

Reject  
Qty

Reject  
Number

Insp.  
Stamp

130

Identify as per dwg & Stock Location: ST023

0.00

\*130\*

Packaging

Packaging

Memo

0.00

12x

80

13-S7

140

QC21- Final Inspection - Work Order Release

0.00

\*140\*

QC

Quality Control

Memo

0.00

13/5/17 JJ

AB-051

NCR: Yes / No

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order: _____			DISPOSITION		AGAINST DEPARTMENT/PROCESS								
Part No. _____	Rework <input type="checkbox"/>	Scrap <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Engineering <input type="checkbox"/>							
NCR No. _____	Use-as-is <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Finishing <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Quality <input type="checkbox"/>							
	Work Order Update <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Composite <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Supplier <input type="checkbox"/>	Other <input type="checkbox"/>							
Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector				
Doc/Data													
Equip/Tooling													
Operator													
Material													
Setup													
Other													
Process													
Supplier													
Training													
Unapproved													
FAULT CATEGORY													
<b>Landing Gear</b> <input type="checkbox"/> Bending <input type="checkbox"/> Centre Not Concentric to O/S <input type="checkbox"/> Cracks <input type="checkbox"/> Crushed/Crimped <input type="checkbox"/> Cuffs <input type="checkbox"/> Heat Treat <input type="checkbox"/> Inspection Strip in Tube <input type="checkbox"/> Ripples in Bend <input type="checkbox"/> Torque Waves in Extrusion <input type="checkbox"/> Turning Sequence <input type="checkbox"/> Wave/Twist in Tube				<b>General</b> <input type="checkbox"/> Bend <input type="checkbox"/> BOM/Route <input type="checkbox"/> Broken/Damaged <input type="checkbox"/> Burrs <input type="checkbox"/> Contamination <input type="checkbox"/> Countersink <input type="checkbox"/> Cut Too Short <input type="checkbox"/> Drill Holes <input type="checkbox"/> Drawing <input type="checkbox"/> Finish <input type="checkbox"/> Folio		<input type="checkbox"/> Grain <input type="checkbox"/> Hardware <input type="checkbox"/> Inspection Incomplete <input type="checkbox"/> Instructions Incomplete/Unclear <input type="checkbox"/> Maintenance <input type="checkbox"/> Mislabeled <input type="checkbox"/> Misread <input type="checkbox"/> Offset <input type="checkbox"/> Out of Calibration <input type="checkbox"/> Out of Sequence <input type="checkbox"/> Outside Dimensions				<input type="checkbox"/> Ovalized <input type="checkbox"/> Over/Under tolerance <input type="checkbox"/> Part Incorrect <input type="checkbox"/> Part Lost/Missing <input type="checkbox"/> Part Moved <input type="checkbox"/> Positioned Wrong <input type="checkbox"/> Power Loss/Surge		<input type="checkbox"/> Pressure/Forced <input type="checkbox"/> Temperature/Cure <input type="checkbox"/> Weld <input type="checkbox"/> Wrong Stock Pulled	

# Picklist Print

April-22-13 1:02:36 PM

Page 1

Work Order ID: 100361

Parent Item: D3012-5

Parent Item Name: Decal

Start Date: 5/28/13

Required Date: 5/28/13

Start Qty: 12.00

Required Qty: 12.00

Comments: Rev A 01.04.06New IssueEC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D3012-5P Decal		Purchased		No		110	Each	0.0000	1	12			

143/6/3(12)

NCR: Yes / No

DQA: \_\_\_\_\_ Date: \_\_\_\_\_

## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: Date:

Work Order: _____			DISPOSITION			AGAINST DEPARTMENT/PROCESS																																						
			Rework <input type="checkbox"/>	Scrap <input type="checkbox"/>	Use-as-is <input type="checkbox"/>	Work Order Update <input type="checkbox"/>	Skid-tube <input type="checkbox"/>	Machining <input type="checkbox"/>	Thermoforming <input type="checkbox"/>	Large Fab <input type="checkbox"/>	Crosstube <input type="checkbox"/>	Small Fab <input type="checkbox"/>	Finishing <input type="checkbox"/>	Composite <input type="checkbox"/>	Water Jet <input type="checkbox"/>	Prod. Eng. Coor. <input type="checkbox"/>	Rec/Store/Packaging <input type="checkbox"/>	Supplier <input type="checkbox"/>	Engineering <input type="checkbox"/>	Quality <input type="checkbox"/>	Other <input type="checkbox"/>																							
Part No. _____																																												
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Root Cause	Date	Step	Qty	Description of work order update or Non-conformance		Initial Chief Eng	Action Description			Sign & Date	Verification		QC Inspector																															
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Process																																												
Supplier																																												
Training																																												
Unapproved																																												
FAULT CATEGORY																																												
Landing Gear				General																																								
				Bending <input type="checkbox"/>	Centre Not Concentric to O/S <input type="checkbox"/>	Cracks <input type="checkbox"/>	Crushed/Crimped <input type="checkbox"/>	Cuffs <input type="checkbox"/>	Heat Treat <input type="checkbox"/>	Inspection Strip in Tube <input type="checkbox"/>	Ripples in Bend <input type="checkbox"/>	Torque Waves in Extrusion <input type="checkbox"/>	Turning Sequence <input type="checkbox"/>	Wave/Twist in Tube <input type="checkbox"/>	Bend <input type="checkbox"/>	BOM/Route <input type="checkbox"/>	Broken/Damaged <input type="checkbox"/>	Burrs <input type="checkbox"/>	Contamination <input type="checkbox"/>	Countersink <input type="checkbox"/>	Cut Too Short <input type="checkbox"/>	Drill Holes <input type="checkbox"/>	Drawing <input type="checkbox"/>	Finish <input type="checkbox"/>	Folio <input type="checkbox"/>	Grain <input type="checkbox"/>	Hardware <input type="checkbox"/>	Inspection Incomplete <input type="checkbox"/>	Instructions Incomplete/Unclear <input type="checkbox"/>	Maintenance <input type="checkbox"/>	Mislabeled <input type="checkbox"/>	Misread <input type="checkbox"/>	Offset <input type="checkbox"/>	Out of Calibration <input type="checkbox"/>	Out of Sequence <input type="checkbox"/>	Outside Dimensions <input type="checkbox"/>	Ovalized <input type="checkbox"/>	Over/Under tolerance <input type="checkbox"/>	Part Incorrect <input type="checkbox"/>	Part Lost/Missing <input type="checkbox"/>	Part Moved <input type="checkbox"/>	Positioned Wrong <input type="checkbox"/>	Power Loss/Surge <input type="checkbox"/>	Pressure/Forced <input type="checkbox"/>



DESIGN <i>CP</i>	DRAWN BY <i>CP</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED <i>✓</i>	APPROVED <i>✓</i>	DRAWING NO. D3012	REV. A SHEET 1 OF 1
DATE 01.03.30	TITLE DECAL		SCALE 1:1
A	01.03.30	NEW ISSUE	

*RELEASED  
01.04.04 AF*

**- POINT A -**  
SWL=300lb/136kg  
**DO NOT USE WITH POINT B**  
P/N D3012-1

D3012-1

**- POINT B -**  
SWL=500lb/227kg  
**DO NOT USE WITH POINT A OR C**  
P/N D3012-3

D3012-3

**- POINT C -**  
SWL=300lb/136kg  
**DO NOT USE WITH POINT B**  
P/N D3012-5

D3012-5

100361 M15  
13-04-23

MATERIAL: WHITE LETTERS ON BLACK ADHESIVE BACK  
MANUFACTURED FROM 3M 7 MIL MASKING FILM #8522CP

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Dart Aerospace Ltd.  
1270 Aberdeen Street  
Hawkesbury, ON K6A 1K7  
Tel: 613 632 9577  
Fax: 613 632 1053

## PURCHASE ORDER

Purchase Order ID **PO19670**

Purchase Order Date 4/23/2013

PO Print Date 4/24/2013

Page Number 1 of 1

Order From : VC-STU001

STUDIO DE LETTRAGE 2001  
210 MAIN WEST  
HAWKESBURY, ON K6A 2H6  
CA

Contact Name	Buyer	Brigitte Golden
Vendor Phone	Requisition Nbr	
Vendor Fax	Tax Resale Nbr	10127-2607
Vendor Account Nbr	Terms	Net 30
	Currency	CAD
	FOB	Destination-Collect

Ship To : DART AEROSPACE LTD 1270 ABERDEEN  
HAWKESBURY, ON K6A 1K7  
CANADA

Line Nbr	Reference Revision ID	Description/ Mfg ID	Req Date/ Taxable	Req Qty/ Unit of Measure	Ship Method	Unit Price	Extended Price
<b>Vendor Part Number</b>							
1	D3012-3P	Decal	4/25/2013 Yes	10.00 Each	Yours ppd	\$7.5000	\$75.00
<b>Special Inst:</b> As per DWG: D3012 Rev: A B100360							
2	D3012-5P	Decal	4/25/2013 Yes	12.00 Each	Yours ppd	\$4.1667	\$50.00
<b>Special Inst:</b> Same as above B100361							
3	D2268P	Placard	4/25/2013 Yes	12.00 Each	Yours ppd	\$6.2500	\$75.00
<b>Special Inst:</b> As per DWG: D2268 Rev: B B100369							
<b>PO Total:</b>							<b>\$200.00</b>

Change Nbr: 3

Change Date: 4/24/2013

No substitution or deviation without  
consent.

Certificate of Conformity of Material  
Certification required - YES  NO

**Studio de Lettrage**

210 Main Street W  
Hawkesbury, Ontario K6A 2H6

**INVOICE**

Invoice No.: 19963  
Date: 04/29/2013  
Ship Date:  
Page: 1  
Re: Order No. WO9778

**Sold to:**

Dart Aerospace Ltd  
1270 Aberdeen  
Hawkesbury, Ontario K6A 1K7

**Ship to:**

Dart Aerospace Ltd  
Hawkesbury, Ontario

Business No.: 82500 7651 RT0001

Item No.	Unit	Quantity	Description	Tax	Unit Price	Amount
		10	3M STICKERS D3012-3P	H	2.5000	25.00
		1	SET UP CHARGE	H	50.0000	50.00
		12	3M STICKERS D3012-5P	H	2.0833	25.00
		1	SET UP <del>1</del>	H	25.0000	25.00
		12	3M STICKERS D2268P	H	2.0833	25.00
		1	SET UP PO#19670	H	50.0000	50.00
			H - HST 13% HST			26.00
Studio de Lettrage HST: #825007651RT0001						
Shipped By:	Tracking Number:					
Comment:						
Sold By:						
					<b>Total Amount</b>	226.00

\*\*\*\*Certificate of Conformity\*\*\*\*

Customer:

Studio Jettrage

<u>Purchase Order #:</u>	<u>Packing Slip #:</u>	<u>Part #:</u>	<u>Serial #:</u>
19670	609770		

<u>Description:</u>	<u>Quantity:</u>
D3012-3P D3012-5P; D2268P	34 Total.

Sertification:

We hereby certify that:

1. The above the listed items were manufactured, repaired and/or inspected in accordance with applicable drawings and/or specifications;
2. All work was accomplished in accordance with the Dart Aerospace Purchase Order;
3. Results of all inspections, chemical or physical tests, as well as other evidence, which shows the acceptability of raw materials, parts and/or assembly components are on file and available for inspection at any time.

Authority:

3M

<u>APPROVAL:</u>	<u>DATE:</u>
Karen Ste. Marie	

Signature: Karen Ste. Marie

<u>Title:</u>	<u>DATE:</u>
Project Coordinator	April 30, 2013.



## Product & Instruction Bulletin 8522

Release I, Effective September 2008

See Bulletin Change Summary and end of Bulletin  
This Bulletin now includes Instruction Bulletin 4.23

# Scotchcal™ Changeable Opaque Imaging Media

8522

For Thermal Inkjet Printing

### Product Description

This durable, 7 mil, opaque, changeable film is optimized for use with selected thermal inkjet printers and inks. Ink dries quickly on the film. When overlaminated, it is warranted for medium term, outdoor weatherable graphics, and long term indoor graphics.

### Recommended Types of Graphics and End Uses

When constructed and used as described in this Bulletin, these types of graphics and end uses may be warranted by the 3M™ MCS™ Warranty. Please read the entire Bulletin for details.

- First surface images (the image is on top of the film) for opaque posters and signs, including:
  - Graphics for vans, personal vehicles, trucks and buses
  - Novelty posters
  - Retail and point-of-purchase displays
  - Information graphics such as maps and directories
  - Entertainment promotions in museums, zoos, parks, theatres, sports venues
  - Education and presentation graphics
  - Legal and courtroom exhibits
- For flat or simple curved surfaces, with or without rivets, used in vertical ( $\pm 10^\circ$ ) applications

### Limitations of End Uses

3M specifically does not recommend or warrant the following uses, but please contact us to discuss your needs or recommend other products.

#### Unsuitable End Uses for This Product

- Not for electronically cut individual letters and numbers
- Fleet applications in areas that use salt for winter road maintenance
- Application to non-warranted substrates, including wallboard
- Applications subjected to gasoline vapors or spills
- Application to corrugated or highly irregular surfaces or sharply raised areas
- Graphics applied to stainless steel, including stainless steel vehicles
- On flat surfaces with rivets, tenting of 4 to 10 mm around rivets may be expected; rivets may be cut around to eliminate tenting.
- Graphics made for automotive Original Equipment Manufacturers (OEM); contact 3M Automotive Division at 1-800-328-1684 for alternatives.

### About Water-Based Inkjet Technology

Standard inkjet technology is water based. Water-based chemistry is susceptible to the extremes of heat and humidity. This is a factor in most product constructions on the market. Read the Fabrication, Shelf Life and Storage sections in this Bulletin. Staying in the middle of these ranges always provides optimum performance.

## Compatible Products

### 3M Graphic Materials

For complete details about graphic construction options, recommended uses and durability, refer to the Product Bulletin for the base film or substrate (media) you are using. See **3M Related Literature** at the end of this Bulletin.

This Bulletin provides details about the base film and construction options and warranty. Additional specific information about compatible products can be found in the Product and Instruction Bulletins listed in **3M Related Literature** at the end of this bulletin.

### 3M Graphic Materials

For complete details about graphic construction options, recommended uses and durability, refer to the Product Bulletin for the base film or substrate (media) you are using. See **3M Related Literature** at the end of this Bulletin.

#### Film

- 3M™ Scotchcal™ Opaque Imaging Media 8522
- 3M™ Scotchcal™ Luster Overlaminate 8519
- 3M™ Scotchcal™ Matte Overlaminate 8520

#### Printers and Inks

HP Designjet Printers	HP Inks
<ul style="list-style-type: none"><li>• 2500CP and 2000CP</li><li>• 2800CP and 3800CP</li><li>• 3500CP and 3000CP</li><li>• HP Designjet 5000 and 5500</li></ul>	<ul style="list-style-type: none"><li>• Designjet CP Ink System UV (pigment-based)</li><li>• Designjet CP Inkjet System (imaging ink)</li></ul>
<ul style="list-style-type: none"><li>• Z6100</li></ul>	<ul style="list-style-type: none"><li>• HP 91 Vivera Ink System</li></ul>

Epson Printers	Epson Inks
<ul style="list-style-type: none"><li>• Stylus Pro 9500</li><li>• Stylus Pro 10000 printer</li><li>• Stylus Pro 10600 printer</li></ul>	<ul style="list-style-type: none"><li>• Archival Inks</li></ul>

## Characteristics

These are typical values for unprocessed product; processing may change the values. Contact your 3M representative for a custom specification.

Characteristic	Description
Media	7 mil, white, opaque graphic film
Liner	Low-slippage, lay flat paper
Adhesive	Changeable, pressure sensitive
Thickness	<b>Media with adhesive:</b> 7.5 to 8 mil (nominal)
Warranted application substrates	See next page.
Application surfaces	Flat or simple curved surfaces, with or without rivets, used in vertical ( $\pm 10^\circ$ ) applications (no corrugations)
Application temperature range	28° to 110°F (-2° to 43°C) (air and surface)
Removable	For up to one year; see Warranty Information

Characteristic	Description
Warranted application substrates	<p>Some substrates may "out-gas", resulting in tiny bubbles throughout the surface of the graphic. For maximum performance, be sure the substrate you select is properly cleaned and prepared as recommended by the manufacturer. See Instruction Bulletin 5.1 for additional information.</p> <ul style="list-style-type: none"> <li>• Alodine (anodized aluminum)</li> <li>• Automotive panels (automotive painted steel)</li> <li>• Fruehauf (painted aluminum)</li> <li>• FRP (fiberglass reinforced plywood)</li> <li>• Glass</li> <li>• Imron® (polyurethane-painted metal panel)</li> <li>• Acrylic</li> <li>• Sintra™ board</li> </ul> <p>Note: Use on any other substrate is strictly on a graphics manufacturer and customer test and approve basis. Test for both adhesion and removal characteristics. The plasticizer in some banner materials may migrate. This may cause the edge of the graphic to peel or lift off of the banner. For optimum performance, follow the guidelines in the section, Creating A Laminated Overlap, on page 4.</p>

## Warranty Information

The warranty given in the Product Bulletin that is current at the time you purchased the film is the one that 3M will honor. **The warranties in the following table(s), given in years, are for finished graphics exposed in a vertical exposure in the United States except the Desert Southwest.** See the warranty sections following this table for additional information.

### 3M™ MCS™ Warranty Durability for Finished Graphics

Construction (film and overlaminate on warranted substrate)	HP Printers & Inks		Epson Printers & Inks		Removal
	Outdoor	Indoor	Outdoor	Indoor	
8522/8519	3 years	5 years	2 years	5 years	1 year without chemical strippers or tools
8522/8520					

### Warranty and Limited Remedy

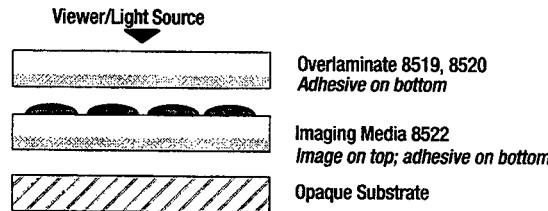
The following is made in lieu of all other express or implied warranties, including any implied warranty of **merchantability** or fitness for a particular purpose or implied warranty arising out of a course of dealing, custom or usage of trade: all 3M products are warranted to be free of defects in materials and manufacture at the time of shipment and to meet the specifications stated in this Product Bulletin. 3M will replace or refund the price of any 3M materials that do not meet this warranty within the specified time periods. These remedies are exclusive. **In no case shall 3M be liable for any direct, indirect, or consequential damages, including any labor or non-3M materials charges.**

See the Graphics Market Center Warranty Brochure, which gives the terms, additional limitations of the warranty, if any, and limitations of liability.

## Graphic Construction Options

### Opaque Graphics

Opaque graphics made with imaging media 8522 require an overlaminant and an opaque substrate.



## Fabrication

### Shop Temperature

Acceptable: 60° to 95°F (15° to 35°C)  
Optimum: 65° to 73°F (18° to 23°C)

### Shop Humidity

Acceptable: 20% to 80%  
Optimum: 45% to 60%

### Condition the Media Before Use

These steps are especially important if you are operating outside the conditions recommended under Fabrication, above.

- Leave the media in its original packaging until you are ready to condition and use it.
- The day before you need it, remove the media from the box and remove the plastic.
- Condition the media for 24 hours in the same environment as the printer.

## Printer Settings for Optimum Quality

Refer to your Hewlett Packard printer manual for detailed operating instructions.

The quality of a printed image depends on a combination of factors: correct media selection, printing software and raster imaging processor (RIP), shop conditions, etc.

The printers qualified to use this media have print mode options that are programmed specifically for these media. Current charts that show the various modes and printing dpi, and the quality results you can expect are available at [www.hp.com](http://www.hp.com) under the website's support section. We recommend that you print the same image at all of these settings to determine acceptable print and productivity results.

The highest quality settings are usually desirable for backlit applications.

The correct media selection makes most other necessary adjustments to the printer.

- For the HP DesignJet CP 2000 or 3000 series printers, select the **Opaque Vinyl UV** setting.
- For the HP Designjet 5000 series printers, select the **3M Changeable UV** setting or the **HP Durable Gloss UV** or **HP Colorfast Vinyl** setting.
- For the Z series printers, refer to HP's website or printer manuals.

Note: The HP printer settings lay down less ink per pass, which results in better ink absorption and quicker drying times.

- For the HP DesignJet CP 2000 or 3000 series printers, select the **Opaque Vinyl UV** setting.
- For the HP Designjet 5000 series printers, select the **3M Changeable UV** setting or the **HP Durable Gloss UV** or **HP Colorfast Vinyl** setting.
- For the Z series printers, refer to HP's website or printer manuals.

Note: The HP printer settings lay down less ink per pass, which results in better ink absorption and quicker drying times.

## Drying Guidelines

Usually, the media can be laminated within 10 minutes after printing. However, especially in high humidity conditions, we recommend waiting 15 to 30 minutes before laminating.

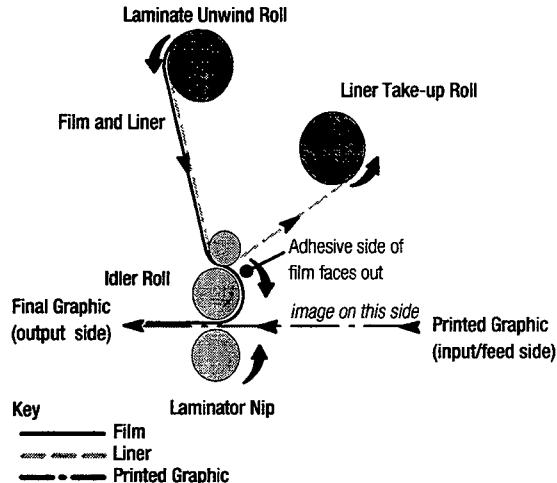
Use care when handling graphics that have not been laminated to avoid scratching and abrasion.

Graphics made with this media and ink combination typically may be wound directly on a take-up roll after printing.

## Overlaminate

Whether or not you want a warranted graphic, an overlaminate is recommended to enhance durability, especially in outdoor applications.

FIGURE 1  
Typical Laminator Thread-up



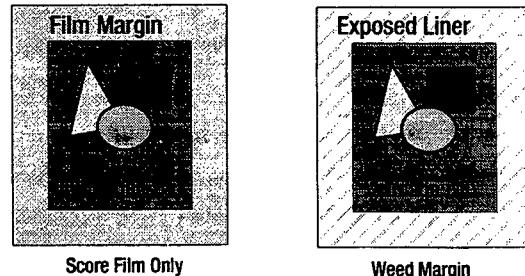
## Creating a Laminated Overlap

Creating a laminated overlap helps ensure that the graphic does not peel or lift away from certain banner materials that may be subject to plasticizer migration. This method may also be used for flat, rigid or flexible sign applications.

1. Print the graphic as usual.
2. On all sides of the graphic, score the *film only* to the correct, final graphic dimension *without cutting through the liner*.

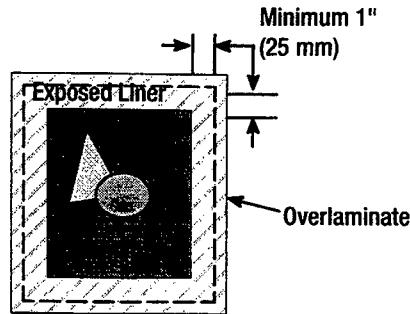
Weed away the excess film, leaving the bare liner exposed around the graphic. See FIGURE 2.

FIGURE 2  
Trim and Weed Film Margin Only



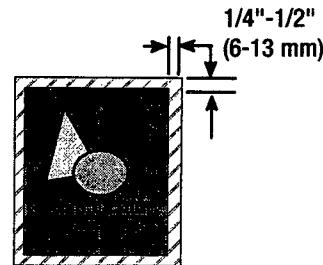
3. Laminate the graphic as usual (see page 5), making sure that at least one inch of the bare liner is covered by the laminate. See FIGURE 3.

FIGURE 3  
Apply Overlaminate



4. Trim the graphic to its final dimensions, making sure to leave a margin of 1/4 to 1/2 inch (6 to 13 mm) laminated liner on all sides that require the laminate overlap. See FIGURE 4.

FIGURE 4  
Trim, leaving a margin of  
overlaminated Liner



## Mounting the Final Graphic

### Mounting Methods

Use the following guide to determine if you should mount the final graphic on its intended sign substrate by hand or with a laminator.

#### Hand

- Thick or rigid graphics
- Removable or positionable adhesive
- Complex sign mounting surface
- Small graphic mounted by 1 person
- Medium to large graphic mounted with 2 people
- Fleet graphics applied directly to the vehicle

#### Laminator

- Thin or flimsy graphics
- Aggressive mounting adhesive
- Flat sign mounting surface
- Medium to large graphic mounted by 1 person

#### Procedure

1. Be sure the temperature of the air, graphic and surface to which you mount the graphic is 45° to 95°F (7° to 35°C).
2. Be sure the substrate is clean and dry. Contaminants prevent good adhesion.
3. If your substrate is susceptible to outgassing, treat it according to the manufacturer's recommendations before mounting the graphic. This avoids bubbling that may be unacceptable.
4. For hand lamination only: Put a low friction paper sleeve over a hard plastic squeegee. The sleeve helps prevent scratching the graphic surface.
5. Position the graphic on the substrate, leaving about a 2 inch (50 mm) margin all around the graphic.
6. Apply a 2 inch (50 mm) wide piece of masking tape across the top edge of the graphic.
7. Flip the graphic over. You can roll the graphic for easier handling, if desired.

8. Flip the graphic over. You can roll the graphic for easier handling, if desired.
9. Strip back some of the liner, starting at the taped edge. Do not allow the adhesive to touch the substrate yet.
10. For hand lamination only:
  - a. Hold the graphic up with one hand and use the other hand to hold the squeegee.
  - b. Starting in the middle of the taped edge of the graphic, use smooth, overlapping strokes to each side of the graphic.
  - c. Stop immediately if you notice some wrinkling. Lift the wrinkled area and reposition. Then gently squeegee the wrinkle to finish smoothing it.
  - d. Pull back some more liner and continue squeegeeing the graphic. To finish the graphic, trim the substrate to the desired size.
11. For a laminator only:
  - a. Position the taped edge of the graphic into the laminator nip.
  - b. Start the laminator.
  - c. As the graphic is pulled through the nip, continue pulling off the liner.
  - d. To finish the graphic, trim the substrate to the desired size.
12. After applying the graphic, resqueegee all edges firmly. Premature lifting of the graphic may occur if the edges are not adequately laminated.

- Unthread the web from the printer and tape the roll closed at the center. It is not necessary to remove the roll from the printer.
- If the media will not be used for a few days, remove it from the printer and rewrap it. See *Shelf Life, Storage and Shipping* on page 4.

## End of Day Protocol

## Care and Cleaning of Graphics

## Removing Graphics

## Health and Safety



When handling any chemical products, read the manufacturers' container labels and the Material Safety Data Sheets (MSDS) for important health, safety and environmental information. To obtain MSDS sheets for 3M products go to 3M.com/MSDS, or by mail or in case of an emergency, call 1-800-364-3577 or 1-651-737-6501.

When using any equipment, always follow the manufacturers' instructions for safe operation.

## Shelf Life, Storage and Shipping

**Shelf Life**      **Total shelf life: 1 year** (processed, unprocessed or any combination thereof)

### Storage Conditions

- New and partially used rolls. For optimum performance, use the middle of these ranges:
  - Original packaging, including plastic wrap to protect from contamination
  - Use an end plug and tape down the edge to prevent damage if the media is stored upright
  - Relative humidity of 20% to 80%
  - Temperature of 33° to 104°F (0° to 40°C)
  - Away from direct sunlight
- Bring the film to print room temperature before using
- Do not stack unprotected rolls or lay sharp or heavy objects on them.
- Do not lay sharp or heavy objects on unprotected rolls and do not stack them.

### Shipping Finished Graphics

Flat, or rolled printed side out on 5 inch (13 cm) or larger core. This helps prevent the liner and, if used, the application tape from popping off.

## 3M Related Literature

Before starting any job, be sure you have the most recent product and instruction bulletins.

The information in 3M Product and Instruction Bulletins is subject to change. Current Bulletins are available at [3Mgraphics.com](http://3Mgraphics.com). The techniques described in these Bulletins are required when applying a 3M warranted graphic, but are also practical recommendations when using promotional materials for non-warranted graphics. Additional Bulletins may be needed as indicated in the 3M Related Literature section of other 3M components you use.

Bulletin types: PB = Product Bulletin; PB-IB = Product & Instruction Bulletin; IB = Instruction Bulletin

Subject	Type	Bulletin No.
3M™ Scotchcal™ Luster Overlaminate 8519 and 8520	PB	8519/8520
Application, substrate selection, preparation and substrate-specific application techniques	IB	5.1
Application, general procedures for indoor and outdoor dry applications	IB	5.5
Storage, handling, maintenance, removal	IB	6.5
3M Graphics Center Warranty Brochure	go to <a href="http://www.3Mgraphics.com">www.3Mgraphics.com</a> , Warranties	

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## Bulletin Change Summary

HP Designjet printer Z6100 and HP 91 Vivera ink systems have been added to the list of compatible printers and inks.

Instruction Bulletin 4.23 has been incorporated into this Bulletin, which is now called Product & Instruction Bulletin 8522.

3M™ Scotchcal™ Instant Dry Translucent Imaging Media 8544, which was shown in Instruction Bulletin 4.23, is obsolete. A backlit graphic option is no longer available.



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